



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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In Reply Refer To:
FWS/Region 5/ES-TE

April 12, 2010

Memorandum

To: Assistant Regional Director, Ecological Services, Hadley, MA

From: Field Supervisor, New York Field Office, Cortland, NY

Subject: Biological Opinion: Enhancement of Survival Permit Application Submitted by The Nature Conservancy, Eastern New York Chapter, to Administer a Safe Harbor Program for Karner Blue Butterfly; Conference Opinion for Frosted Elfin and Persius Duskywing

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based upon our review of a proposed enhancement of survival permit (ESP) to The Nature Conservancy (TNC) and its effects on the Federally- and State-listed endangered Karner blue butterfly (*Lycaeides melissa samuelis*) in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). A conference opinion is also provided for the frosted elfin butterfly (*Callophrys irus*) and for Persius duskywing (*Erynnis persius persius*), listed respectively as threatened and endangered by the State of New York, and which could be included in the ESP at a later time if either species becomes listed under the Federal ESA.

These biological and conference opinions are based on information provided in TNC's application, the Service's National Environmental Policy Act decision document, information obtained from the scientific and commercial literature, telephone conversations, field investigations, and other sources of information. All of the aforementioned documents are incorporated herein. A complete administrative record of this consultation is on file in the Service's New York Field Office, Cortland, New York.

Description of the Proposed Action

The proposed action is issuance by the Service of an ESP to TNC to administer a safe harbor program in the Karner blue butterfly Glacial Lake Albany (GLA) recovery unit for a period of 30 years. The GLA recovery unit is located in portions of Albany, Saratoga, Schenectady, and

Warren Counties, New York. Issuance of the ESP necessitates Service approval of the Safe Harbor Agreement (SHA) with TNC and the New York State Department of Environmental Conservation (NYSDEC), and the SHA is incorporated by reference into this biological opinion. The purpose of the SHA is to promote the conservation of the Karner blue butterfly by encouraging restoration, creation, enhancement, and management of their habitat on non-Federal and non-TNC land.

Under the SHA, TNC will hold the ESP and sign binding contracts memorialized as cooperative agreements with landowners who voluntarily allow implementation of conservation measures to benefit the Karner blue butterfly, frosted elfin, and Persius duskywing. In return, these property owners receive regulatory assurances that the Service will allow the "incidental take" of Karner blue butterflies associated with their implementation of specified management activities and/or their lawful use of the enrolled property after the management activities have been initiated. The cooperating agency, NYSDEC, is also expected to sign the SHA, thereby allowing the incidental take of Karner blue, frosted elfin, and Persius duskywing butterflies consistent with New York State rules and regulations. The NYSDEC will also provide technical expertise to assist with implementation of the provisions of the SHA.

Prior to executing each cooperative agreement, TNC or their designated agents (currently Albany Pine Bush Preserve Commission and Wilton Wildlife Preserve and Park) will perform surveys to determine baseline habitat conditions on the landowner's property. In accordance with methods prescribed in SHA Appendix B, properties containing suitable habitat may be deemed occupied because they are in close proximity to sites known to be occupied by one or more of the three butterfly species, or they may be surveyed to determine the presence, and potentially the abundance, of Karner blue and frosted elfin butterflies. Given the difficult nature of identifying Persius duskywing, requiring dissection and comparison of male genitalia under a microscope, the Service will assume, for the purpose of baseline determination, that Persius duskywing may be present at sites with documentation of Karner blue and/or frosted elfin butterflies. Baseline conditions for most properties are expected to be zero. Landowners, also referenced as "cooperators" may then sign cooperative agreements (template provided in SHA Appendix A) with TNC that will: (1) include a map of the property delineating any existing occupied habitat and suitable unoccupied habitat, (2) describe proposed habitat improvements, (3) provide TNC or its designees with access to the property to assess habitat conditions and to monitor and/or mark butterflies, and (4) specify the duration of the agreement up to but not exceeding the life of the ESP. In many cases, the cooperative agreement will also authorize TNC, with Service and NYSDEC concurrence, to translocate Karner blue butterflies, frosted elfin, or Persius duskywing to or from the cooperator's property.

It is anticipated that most management activities to improve or maintain Karner blue butterfly habitat conditions on lands enrolled under this SHA will be implemented by TNC or their designated agents. TNC already receives authorization to conduct such activities via a subpermit issued by NYSDEC under the provision E.12 of Service permit number TE838253-6, dated May 15, 2007. However, in some cases, the cooperative agreement may provide for habitat management activities to be directly implemented by the landowner. Landowner-implemented management is most likely to include mowing; cutting and removal of woody, shrubby, or

invasive plants; and construction of fencing to exclude herbivores. In order to avoid or minimize near-term adverse effects that may attend such management activities in occupied habitat and thereby maximize recovery benefits, the following conservation measures will be specified, where applicable, in the cooperative agreement:

- Mowing of lupine in occupied habitat shall be avoided until after the first frost of the year. In cases where this is not possible, mowing shall never occur before August 15, and only one mowing may be conducted prior to the first frost.
- Blades of mowers and brush-hogs used in occupied habitat shall be set at least 6 inches (and preferably more than 8 inches) above ground.
- Tree removal shall not take place until after August 15, and removal shall be conducted to minimize damage to lupine. Trees/shrubs shall be left on at least 10% of the site, except when removing clonal species (*e.g.*, black locust, aspen) or heavy seeders (*e.g.*, white pine).
- Fencing in or near occupied habitat should not be constructed during Karner blue butterfly flight periods. Fences should be limited to the periphery of suitable habitat and damage to lupine plants should be minimized.

If desired, landowner implementation of any other habitat management activities (*e.g.*, herbicide application, prescribed burning, collection of lupine seed) and related potential incidental take will be authorized by site-specific subpermits issued in accordance with provision E.12 of permit number TE838253-6 or similar provisions in future amendments to this permit. Translocation of Karner blue butterflies to or from enrolled properties will be conducted under the auspices of permit number TE838253-6, provision G.

Participating landowners who enter into legally-binding cooperative agreements with TNC, as well as their successors who choose to become parties, will be included within the scope of the ESP by Certificates of Inclusion. In order to give assurance that the voluntary habitat improvements made by the landowners do not restrict present and subsequent owners, the permit issued to TNC will authorize incidental taking of Karner blue butterflies by landowners covered by Certificates of Inclusion for a period of 30 years, or more if extended, regardless of the term of the landowner's cooperative agreement.

As long as the cooperating landowner carries out the agreed-upon habitat improvements and maintains his or her environmental baseline responsibilities, if any, on the property over the life of the agreement, he or she may eventually develop, modify vegetation management, or make any other lawful use of the property, even if such use incidentally results in the loss of Karner blue butterflies or their habitat. There are three limitations on this right. First, the cooperator may not capture, collect, or deliberately kill or injure Karner blue butterflies. Second, off-trail motorized vehicle use and construction within butterfly habitat are proscribed during the life of the agreement. Third, except in emergency situations, a participating landowner who plans to carry out an action likely to result in an incidental taking of Karner blue butterflies, either after the expiration of the cooperative agreement or if the landowner exercises the right to early termination of the agreement for reasons outside his or her control, must give TNC a minimum

60-day advance notice and an opportunity to translocate the butterflies if TNC, the NYSDEC, and Service so choose.

Should either the frosted elfin or Persius duskywing be listed under the ESA in the future, TNC may request an amendment to the SHA and ESP to include the newly listed species, including any baseline conditions established under prior agreements with cooperating landowners. Documentation of surveys and baseline conditions for frosted elfin and Persius duskywing, as specified in SHA Appendix B, will be incorporated into landowner agreements under the terms of the NYSDEC permit to be issued to TNC in accordance with section 182.4 of Title 6 of the New York Code of Rules and Regulations. Habitat management activities for frosted elfin and Persius duskywing are the same as those described for Karner blue butterflies.

Species Not Considered Further in This Opinion

In 2007, the bald eagle (*Haliaeetus leucocephalus*) was determined to be recovered and removed from the protections of the ESA.

There are two known winter hibernacula for the endangered Indiana bat (*Myotis sodalis*) in the GLA counties, one in Albany County and one in Warren County. However, both hibernacula are located outside the primary zone of sand deposits that constitute Karner blue butterfly habitat. There is a summer record of a male Indiana bat in Albany County; to date, however, there are no summer records of Indiana bats within the GLA. Furthermore, the vast majority of trees likely to be removed during habitat restoration and maintenance have smooth bark (*e.g.*, aspen, young black locust) which does not provide roosting sites for Indiana bats. Due to scarcity, or perhaps complete absence, of this species in the action area and the infrequency of management actions that could affect any individuals that might be present, effects of the proposed action on Indiana bats are discountable. This species is not considered further in this biological opinion.

BIOLOGICAL OPINION FOR KARNER BLUE BUTTERFLY

Rangewide Status of the Species

Listing Status

The Karner blue butterfly was listed as endangered under the ESA in 1992. No critical habitat has been designated for this species. This species has been listed as endangered by the State of New York since April 1977.

Species Description

The Karner blue butterfly is a member of the Order Lepidoptera, Family Lycaenidae. Adult butterflies are rather small, with a wingspan of between 2.2 and 3.2 centimeters. The dorsal surface of the wing of males is silvery blue, with a narrow black border and a white fringe. The dorsal surface of the female is similar, but more brown in color, with a row of dark spots with orange crescents. The ventral surface of the wings of both sexes is slate gray with several marginal rows of orange and black spots.

Life History

The following is a summary of Karner blue butterfly life history. The Karner Blue Butterfly Recovery Plan (Recovery Plan) (Service 2003) provides a comprehensive summary of Karner blue butterfly life history and is incorporated by reference.

The Karner blue butterfly has two broods, or adult flight periods, each year. Eggs that have overwintered from the previous year hatch in April. The larvae feed on wild lupine leaves and mature rapidly. Near the end of May, the larvae pupate and adult Karner blue butterflies emerge very late in May in most years. The adults are typically in flight for the first 10 to 15 days of June when the wild lupine is in bloom. Female Karner blue butterflies lay eggs on or near wild lupine plants. The eggs hatch in about one week and the larvae feed for about three weeks. They then pupate and the second brood of adults appears about the first or second week of July. This flight of adults lays their eggs among leaf litter or on grass blades at the base of lupines or on lupine pods or stems; these eggs do not hatch until the following spring. Generally, by late August, no adults remain. Cold and/or rainy weather can delay the two flight periods of the butterfly.

In addition to wild lupine, the Karner blue butterfly generally requires tall grass for late afternoon basking and overnight roosting, some shading vegetation to prevent overheating, a source of water, and nectar sources for the adults. A variety of understory plants serve as nectar sources for the adults.

Since the only known food plant for Karner blue butterfly larvae is wild lupine, the distribution of the Karner blue butterfly is closely tied to the distribution of habitats that support the wild lupine. In eastern New York and in New Hampshire, this habitat typically occupies sandplain communities and grassy openings within very dry pitch pine/scrub oak barrens. In the mid-western states, the habitat is also dry, sandy openings, including openings in oak savannas, jack pine (*Pinus banksiana*) stands, and dune or sandplain communities.

The Karner blue butterfly is an example of a species for which suitable habitat occurs in relatively small areas or patches distributed over the landscape. Like other species whose habitat occurs in patches rather than large continuous tracts of land, populations of the Karner blue butterfly exist as dynamic collections of subpopulations (metapopulations) that are interconnected genetically by dispersal. Metapopulations have been described further as dynamic clusters of subpopulations (or demes) continually shifting in distribution across a changing landscape of habitat patches in varying stages of disturbance and succession (Givnish et al. 1988, Schweitzer 1989).

To preserve species with patch distributions, it is necessary to maintain: (1) existing patches of suitable habitat, (2) the processes that create new habitat patches, and (3) the corridors that allow a species to migrate between habitat patches (Harrison et al. 1988). Various studies have shown dispersal of the Karner blue butterfly to range from about 200 yards (about 600 feet) to about 2 miles. Open linear areas such as road and railroad rights-of-way, utility corridors, and forest

roads and trails can serve as dispersal corridors for the Karner blue allowing them to re-colonize or colonize wild lupine patches.

Distribution and Status

Historically, the Karner blue butterfly occurred in 12 states and the Canadian province of Ontario. As of 2009, it was extant in seven states (New Hampshire, New York, Ohio, Indiana, Michigan, Wisconsin, and Michigan), with the greatest number of occurrences in Michigan and Wisconsin. The Karner blue is considered extirpated from five states (Iowa, Illinois, Pennsylvania, Massachusetts, and Maine) and Ontario. Over the past 100 years, the overall number of individuals present in all populations declined by 99 percent throughout the species' range, with more than 90 percent of that decline during the 10 to 15 years prior to the 1992 ESA listing. The species is currently being reintroduced at four locations (Concord, New Hampshire; West Gary, Indiana; Petersburg State Game Area, Michigan; and in northeast Ohio). Population augmentation is also on-going at the Albany Pine Bush in New York.

The decline of Karner blue butterfly populations has resulted chiefly from loss of habitat due to fire suppression, conversion by agriculture and forestry practices, and commercial and residential development (Service 2003). In addition, incompatible management practices (*e.g.*, timing of controlled burns and mowing) within suitable habitat can adversely affect the Karner blue butterfly.

Wisconsin supports the largest and most widespread Karner blue butterfly populations. Most of the 305 occurrences in the Wisconsin Natural Heritage Inventory Database can be grouped into about fifteen large population areas in central and northwest Wisconsin (Wisconsin Department of Natural Resources 2000). The majority of Wisconsin Karner blue butterfly sites are on state, county, or Federal lands.

Species Recovery

The goal of the Recovery Plan is to perpetuate viable metapopulations of the Karner blue butterfly in the major ecological regions throughout its geographic range. Thirteen ecological regions or recovery units and six potential recovery units are identified.

The recovery objective is to perpetuate viable populations and large viable metapopulations of the Karner blue butterfly in the major physiographic, vegetational, and climatic regions throughout the range of the butterfly. The criteria (summarized) for reclassification from endangered to threatened status are:

1. Establish viable populations and large viable populations of Karner blues in the 13 specified recovery units; and
2. Each viable population shall have a management and monitoring plan to be implemented into the future, a sufficient number of individuals in an appropriate metapopulation structure for at least five years after the implementation of the management plan, and connectivity

between subpopulations so that the average nearest-neighbor distance is no more than 1 kilometer and the maximum distance is no greater than 2 kilometers.

Also, each large viable population shall have the above as well as a larger areal extent and more suitable habitat than required for a viable population, a more robust metapopulation structure with a larger number of individuals than a viable population, and reduced monitoring and management requirements compared to those required for a viable population.

The criteria for delisting are the same with the addition that each viable population shall be demonstrably self-reproducing, shall be maintained at or above minimum allowable population sizes, and shall be managed and monitored under the specific management and monitoring plans for at least 10 consecutive years.

Recovery Units

As stated above, thirteen recovery units have been identified for the Karner blue butterfly. One of these recovery units is in New York and includes the area between Glens Falls and the Albany Pine Bush and is named the Glacial Lake Albany (GLA) Recovery Unit. Two potential recovery units were also identified in the Recovery Plan in the Rome Sandplains and Tonawanda areas in central and western New York (see map, Appendix B-11) (Service 2003). Within the GLA Recovery Unit, three viable Karner blue butterfly populations (metapopulations) are required under criterion #1.

Environmental Baseline

Action Area

The action area for this biological opinion is the GLA. Within the GLA, Karner blue butterflies are known to occur in four counties (Albany, Saratoga, Schenectady, and Warren). However, not all areas within these counties are suitable for habitat restoration. Restoration work will be focused in the zone of sand deposits created by glacial melt water streams and rivers that flowed into Glacial Lake Albany. Furthermore, while landowner participation may be opportunistic throughout the GLA, the priority is to restore and manage lands adjacent to existing Karner blue butterfly populations within established potential viable population areas (Queensbury, Saratoga West, Saratoga Sandplains, and Albany Pine Bush) (see Figure 2 in the Environmental Assessment for the SHA). However, TNC may also restore and manage habitat in the vicinity of sites that are more isolated from existing populations, especially if, over time, connection of these sites with occupied habitat through additional restoration actions is anticipated.

Status of the Karner Blue Butterfly within the Action Area

The Karner blue butterfly is known from approximately 28 locations in New York (all within the GLA Recovery Unit) at this time. There may be multiple management sites within a given subpopulation and habitat restoration activities have connected many previously separate areas. At least half of the New York management sites are 10 acres or less in size and another

25 percent are less than 20 acres (O'Brien, pers. comm. 2009a). These small sites are threatened by unfavorable mowing practices, woody encroachment from adjacent woodlands, development, and incompatible management practices.

The following paraphrased information was provided for the 2008 Service Recovery Data Call: In 2008 we saw a continuation of the general downturn except in a few locations where Karner blue butterflies are expanding into recently created habitat adjacent to an existing subpopulation. Numbers at most known sites are lower than past years and even more sites may be extirpated. In Albany Pine Bush, the highest number seen at any site was a spring brood count of 19 which then had a peak second flight count of 8. In Saratoga Sandplains, the new habitat sites had peak counts markedly higher than in 2007 (103 was the highest count at one site, with several in the 90s), but almost all had summer brood counts much lower than the spring. The Saratoga Airport had second brood counts over 100 for the first time since 2005; however, most of the other sites in Saratoga West had extremely low counts. There are no currently viable sites within the Queensbury population. Loss of lupine due to succession and/or damage from human activity, as well as weather, may account for the low counts at many sites (O'Brien pers. comm. 2008).

The 2009 Service Recovery Data Call indicated an increase (compared to very low counts in 2006-2008) in the Saratoga County Airport population, with general declines at other New York (GLA) sites (O'Brien pers. comm. 2009b).

Factors Affecting the Species' Environment within the Action Area

Habitat loss, fragmentation, and degradation are considered the primary threats to the survival of the species (Service 2003). Development throughout the Saratoga, Queensbury, and Albany regions has contributed to the species' decline and remains the primary threat to Karner blue butterflies in New York State. Fire suppression, resulting in vegetational succession, and habitat fragmentation have also impacted Karner blues in New York. These activities have reduced the native vegetation of the Albany Pine Bush in New York State from 25,000 acres to about 2,500 acres. However, the NYSDEC and partners like TNC are actively working to restore habitat throughout the Albany Pine Bush and Saratoga Sandplains.

Ongoing Karner blue butterfly management and monitoring (*e.g.*, monitoring and marking butterflies; mowing and prescribed burning of vegetation; collection of lupine seed; captive-rearing and translocations of butterflies) under the auspices of Service permit number TE838253-6 may exert near-term adverse effects on small proportions of local populations of Karner blue butterflies; however, these activities are also essential to maintaining long-term habitat conditions that cannot persist without regular active management.

A biological opinion issued to the Federal Aviation Administration in 2002 and subsequent amendments (most recently on September 28, 2009) documented effects and anticipated incidental take associated with operation of the Saratoga County Airport in Milton, New York. Although anticipated take at Saratoga Airport totals almost 300 acres, only about 29 acres have been or will be subject to permanent loss or recurring disturbance, and most of the balance is

associated with mowing that will maintain suitable Karner blue butterfly habitat. No other biological opinions have been issued for Karner blue butterflies in the GLA.

Effects of the Action

Under section 7(a)(2) of the ESA, “effects of the action” refers to the direct and indirect effect of an action on the species, together with the effects of other activities that are interrelated or interdependent with that action. Effects considered in this biological opinion include: beneficial effects of habitat management and translocation of Karner blue butterflies to and from enrolled lands in the GLA during the life of the SHA; near-term effects of habitat management activities that may be conducted by the landowner/cooperator; and effects associated with a landowner’s right to return enrolled properties to baseline.

Beneficial Effects

Restoration, enhancement, and maintenance of suitable habitat conditions on private lands voluntarily enrolled under the SHA will expand the Karner blue habitat base and populations in the GLA and improve connectivity among populations. These benefits will persist for at least the duration of the landowner agreements. Without the assurances furnished by the SHA, many of the potential cooperator’s properties would not otherwise be used by this species. These benefits are especially valuable because they address a major threat to Karner blue butterflies in the GLA – loss and fragmentation of suitable habitat.

The proposed action implements several tasks in the Karner blue butterfly recovery plan (Service 2003). Task 1.43 specifically identifies Safe Harbor Agreements as a tool to encourage private landowner participation in Karner blue butterfly conservation and recovery, and task 1.412 calls for review of section 10(a)(1)(A) permits. Other tasks that will be served by the proposed action include 1.23 (continue/start management activities for New York), 2.213 (initiate/continue reintroductions and accelerated colonization in New York), and 4.3 (encourage private landowners to conserve the Karner blue butterfly).

Effects of Habitat Management by Cooperators

It is anticipated that most lands to be enrolled under this SHA will be unoccupied by Karner blue butterflies. Therefore, initial habitat restoration or enhancement activities will have no potential for adverse effects on the species.

Once butterflies are repatriated to enrolled lands via translocations or by natural expansion from nearby occurrences, management activities required to maintain suitable habitat may result in some take of individual butterflies (egg, larvae, pupae, or adult) or temporary short-term degradation of habitat. Conservation measures (*e.g.*, time-of-year restrictions) to minimize potentially negative effects of any landowner-implemented mowing; mechanical cutting and removal of trees, other woody vegetation, and invasive plants; and fencing will be included as permit conditions. Although mowing and cutting/removal of woody vegetation after the first

frost will still cause unavoidable take of eggs in occupied habitat, the overall benefits of restoring and maintaining suitable habitat conditions far outweigh the adverse effects.

Effects of other habitat management activities (*e.g.*, prescribed burning and herbicide application), butterfly translocations, and monitoring of butterfly populations to be conducted under the auspices of permit number TE838253-6 and, therefore, technically outside the purview of this biological opinion, are likewise expected to carry short-term adverse effects. These short-term effects, however, are essential to the long-term survival of the species. Furthermore, an expanded habitat base and increased populations facilitated by these management activities on lands enrolled under the SHA are fundamental to increasing the overall demographic security of this disturbance-dependent species. The increased distribution of butterfly populations is also anticipated to decrease the likelihood that management activities in any one area will impact many individual butterflies.

Return to Baseline

Provisions of the SHA and associated agreements preserve the landowner's right to return the habitat to baseline conditions upon termination of the agreement. A 60-day notification requirement allows for the potential translocation of any Karner blue butterflies. Thus, the species will be no worse off as a result of the SHA than it would have been without it. Furthermore, even temporary expansion of Karner blue butterfly habitat and range in the GLA will provide a conservation benefit to the species by: (1) providing supplemental habitat for existing populations for, at minimum, the duration of the agreement; (2) increasing potential for genetic exchange among otherwise isolated populations; and (3) affording additional opportunities to learn about Karner blue butterfly reintroduction and dispersal. Furthermore, it is unlikely, but not impossible, that all enrolled properties will be simultaneously returned to baseline, and it is plausible that some properties will be maintained as suitable and occupied habitat after expiration of the SHA. In a worst-case scenario, the program will have provided interim benefits in the form of habitat augmentation and range expansion during its duration while other efforts by the Service, NYSDEC, TNC, and partners increase protected habitat permanently in the GLA.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The Service anticipates that all existing non-Federal threats to Karner blue butterflies in the GLA are reasonably certain to continue at approximately current levels. They include, but may not be limited to, commercial and residential development, road construction and maintenance, utility right-of-way maintenance, contaminants, off-road motorized traffic, agriculture, deterioration of potential habitat in the absence of natural processes, and stochastic events (*e.g.*, wild fire) particularly destructive to small, isolated populations.

Conclusion

After reviewing the current status of Karner blue butterfly, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that issuance of an ESP for implementation of the SHA is not likely to jeopardize the continued existence of the species. The proposed action will facilitate restoration, enhancement, and maintenance of suitable habitat for Karner blue butterflies in the GLA that would be very unlikely to occur but for the assurances provided by the SHA. The SHA will provide short-term benefits to the species. In the long-term, the species will be no worse off than it would be without the SHA.

No critical habitat has been designated for Karner blue butterflies; therefore, none will be affected.

Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement. Incidental take resulting from activities conducted in accordance with conditions of the SHA is incorporated herein by reference.

Amount or Extent of Take

Incidental take is anticipated to occur as a result of landowner-implemented management activities conducted to maintain suitable habitat conditions in occupied habitat and when landowners exercise their right to return enrolled lands to baseline.

Estimating the number of Karner blue butterfly adults, eggs, larvae, or pupae individuals taken by any activity is very difficult for the following reasons: the small size and delicate anatomical structure of the various life stages of the species; losses may be masked by fluctuations in numbers from other causes; and finding a dead or impaired specimen is unlikely. Due to these difficulties, estimates of anticipated take of Karner blue butterflies are typically based on the

habitat acreage affected by a given activity. In the case of this SHA, however, even the total acreage that will be enrolled cannot be anticipated in advance.

Take associated with mowing and by removal of woody and invasive vegetation after August 15 by landowners will be largely limited to eggs, although a few late-flying adults may also be present. Fencing on the periphery of suitable occupied habitat outside flight periods could also crush some larvae or pupae, but should only affect a small proportion of the local population. The Service anticipates that no more than a third of total habitat enrolled in the SHA in any given year will be impacted by landowner management activities. However, it is likely that the percentage will be substantially smaller since much of the management activity will take place in areas where suitable habitat has not yet been restored and which is, therefore, unoccupied by the species.

Take resulting from removal of native plant species during a return to baseline conditions may involve Karner blue butterflies in various life stages. If all lands restored under the terms of the SHA are unoccupied at the time of enrollment and, therefore, have a baseline of zero, take could involve all individuals not translocated by TNC, NYSDEC, and/or the Service. Potential acres of occupied habitat taken during return to baseline are equivalent to acres of habitat restored to suitable habitat conditions and repatriated by Karner blue butterflies. Thus, the potential incidental take is commensurate with, and a reflection of, the success of TNC in enrolling properties and expanding Karner blue butterflies onto those lands.

Effect of the Take

We have determined that the level of anticipated take is not likely to result in jeopardy to the species. No Karner blue butterflies will be taken that would have existed but for the proposed action.

Reasonable and Prudent Measures

The SHA contains extensive monitoring and reporting requirements of TNC that will be incorporated by reference into the ESP. These include:

1. Inform the Service and the State by e-mail or ground mail at the time of notification by the Cooperator or as soon thereafter as practicable, but no later than 10 business days, of the Cooperator's intent to make a change in land use likely to eliminate or reduce the amount of occupied habitat on the Enrolled Property, and cooperate with such agencies in the event that they choose to capture and/or relocate potentially affected individuals in response to such notification.
2. Monitor implementation of management activities specified in cooperative agreements and carry out annual surveys of enrolled properties to assess significant changes of abundance of the covered species thereon.

3. Maintain and provide electronic records and documentation of all Enrolled Properties for the duration of the permit. These shall include:
 - a. Cooperator contact information and
 - b. Digital maps of baseline conditions (GIS).
4. Report to the Service and the NYSDEC by telephone or e-mail at the time of the discovery or as soon thereafter as practicable, the discovery by TNC and/or its designees of any unauthorized destruction of occupied habitat, or dead or injured specimens of the covered species observed on enrolled properties (other than specimens obviously affected by such natural causes as predators or parasites) and, if requested by the Service or the NYSDEC, taking such actions as requested to document the discovery.
5. Provide the Service and the State with an annual report, due on or before March 1 of each year this Agreement is in effect, that indicates if a Cooperative Agreement has been entered into and, if so, describes progress in implementing specified management activities, the results of annual surveys, the names of any qualified agents or contractors working on TNC's behalf in implementing the Agreement, and any compliance issues with regard to Cooperative Agreements.
6. Inform the Service and the State by e-mail or ground mail at the time of notification by the Cooperator or as soon thereafter as practicable, but no later than 10 business days, of the Cooperator's intent to transfer his/her Enrolled Property.

The ESP will also require incorporation of the conservation measures, as specified in the description of the proposed action, into cooperative agreements that include landowner-implementation of habitat management activities. The Service believes that no additional reasonable and prudent measures are necessary and appropriate to minimize incidental take of Karner blue butterflies.

CONFERENCE OPINION FOR FROSTED ELFIN AND PERSIUS DUSKYWING

Section 7(a)(4) of the ESA provides a mechanism for identifying and resolving potential conflicts between Federal actions and proposed species or proposed critical habitats. To distinguish this procedure from consultation on listed species, it is referenced as conferencing. A conference is required only when an action is likely to jeopardize the continued existence of a species that has been formally proposed for listing under the ESA or destroy or adversely modify proposed critical habitat. However, at the request of a Federal agency, a conference may be conducted for a proposed action that may affect proposed species, candidate species, or species of concern. In the case of this action, the Service has elected to conduct and document analysis of effects on frosted elfin and Persius duskywing.

A conference process is similar to the consultation process and may be either informal or formal. A formal conference culminates with the Service writing a conference opinion that follows the same format as the biological opinion. If the species is subsequently listed prior to completion of the action, the conference opinion provides a basis for formulation of a biological opinion. An

incidental take statement provided with a conference opinion does not become effective unless the species is listed and the Service adopts the opinion.

Rangewide Status of the Frosted Elfin

Listing Status

Frosted elfin has never been formally considered for listing under the ESA. It has been listed as threatened by the State of New York since 1999.

Species Description

Like the Karner blue butterfly, the frosted elfin is a member of the order Lepidoptera, Family Lycaenidae. They are brown butterflies, approximately 2.5-3.2 centimeters across the wings, and can be identified by a black spot above a short tail stump on the hindwing, which also carries the gray “frosting” for which they are named.

Life History

Frosted elfin have one flight period per year (i.e., they are univoltine). Typical home ranges appear to be even smaller than those of Karner blue butterflies (≤ 200 meters) (Williams, pers. comm. 2007), but distribution patterns suggest good colonizing ability across open landscapes or corridors over distances up to a few kilometers (NatureServe 2009a). In New York, adults fly in late April to early June. Frosted elfin lay their eggs singly on flower buds of lupine. There are two ecotypes (or unlikely sibling species) of frosted elfin (NatureServe 2009a). One feeds on wild blue lupine flowers and developing pods and, if necessary, leaves in the last instar; the other feeds on young leaves of wild indigo (*Baptisia tinctoria*) or occasionally on other species of *Baptisia*. In New York, frosted elfins associated with wild blue lupine occur in Albany, Oneida, Saratoga, Schenectady, Genesee, and Warren Counties and those associated with wild indigo occur in Suffolk County. After the caterpillars finish feeding, they form a chrysalis in the soil or duff layer where they overwinter as pupae just below the soil surface at the base of wild blue lupine plants.

Distribution and Status

Although a major portion of its range (from southern New England to Wisconsin) coincides with that of the Karner blue butterfly, the frosted elfin has a much larger range that also extends across the southeastern U.S. NatureServe (2009a) reports it as extirpated in Maine, Ontario, and possibly Illinois; critically imperiled in Wisconsin, Indiana, Pennsylvania, Delaware, Rhode Island, New Hampshire, Maryland, West Virginia, Ohio, Kentucky, and Florida; and imperiled in Massachusetts, Connecticut, New Jersey, Tennessee, North Carolina, and Virginia. It is not rated as secure in any state. NatureServe (2009a) assigns a global status of G3 (vulnerable) and a status of S1S3 in the State of New York. The global long-term trend for the species is characterized as very large to substantial declines (decline of 50 to >90%) and the global short-term trend is rapidly declining (decline of 10 to 50%).

Threats to frosted elfin are similar to those of the Karner blue butterfly. Given their dependence on flowers and seeds when eating lupine, frosted elfins are more vulnerable to deer browse than Karner blue, but lupine-feeding frosted elfin pupating in the soil may have better survival during hot fires. Where they occur together, the frosted elfin is nearly always scarcer than the Karner blue, but it is also clearly more capable of persisting in low numbers (NatureServe 2009a).

Rangewide Status of the Persius Duskywing

Listing Status

Persius duskywing has never been formally considered for listing under the ESA. The full species has been listed as endangered by the State of New York since 1999. However, there is a widely accepted subspecies (*Erynnis persius persius*) that includes all populations of the species in the eastern U.S., including New York (NatureServe 2009b, Shepherd 2005). These populations are widely disjunct from the rest of the range. This conference opinion considers effects on the more vulnerable subspecies, but its implications also pertain to the full species.

Species Description

The Persius duskywing is a member of the order Lepidoptera, Family Hesperidae. They are small, dark, sometimes frosted butterflies with a few clear dots on the forewings. The species is separated into four described subspecies, including the Eastern Persius duskywing, which is found in New York.

Persius duskywing look similar to the closely related Columbine duskywing (*E. baptisiae*) and Indigo duskywing (*E. lucilius*). While *E. lucilius* is associated with wild columbine and, therefore, is unlikely to be confused with Persius duskywing in New York, *E. baptisiae* feeds on the same hostplants as Persius duskywing. The best method of identifying Persius duskywing adults is through dissection and examination of male genitalia under a microscope.

Life History

Persius duskywing have one flight period per year from late April to early June. Eggs are laid singly on the underside of hostplant leaves. Larval foodplants include leaves of wild blue lupine and wild indigo. In New York, Persius duskywings associated with wild blue lupine occur in at least one location in Saratoga County and those associated with wild indigo occurred historically in Suffolk County. Young caterpillars feed and live in shelters made by rolling or tying leaves together (Shepherd 2005). Mature larvae overwinter, pupating in early spring.

Distribution and Status

Although a major portion of its range (from southern New England to Wisconsin) coincides with that of the Karner blue butterfly, the eastern subspecies of Persius duskywing has a slightly larger range that also extends into West Virginia and Virginia.

NatureServe (2009b) reports *Erynnis persius persius* as extirpated in Maine and Ontario; possibly extirpated in New Jersey, New York, and Rhode Island; critically imperiled in Connecticut, Massachusetts, Minnesota, New Hampshire, and Virginia; imperiled to critically imperiled in Indiana and Pennsylvania; and vulnerable in Michigan. NatureServe (2009b) assigns a global status of G5T1T3 (secure species but vulnerable to critically imperiled subspecies) and a status of SH in the State of New York. The global long-term trend for the species is characterized as large to substantial declines (decline of 50 to 90%) and the global short-term trend is stable.

Threats to Persius duskywing are similar to those of the Karner blue butterfly. Where they occur together, the Persius duskywing is nearly always scarcer than the Karner blue, but it is also clearly more capable of persisting in low numbers (NatureServe 2009b).

Environmental Baseline for Frosted Elfin

Status of the Species in the GLA

Presence of frosted elfin is often documented in conjunction with Karner blue butterfly surveys in the GLA when frosted elfin are generally past their peak numbers. O'Brien (pers. comm. 2009c) reports that frosted elfin are probably present at all of the New York Karner blue butterfly sites, as well as a few additional lupine sites. Frosted elfin appear to persist in smaller lupine patches. Surveys for frosted elfin are constrained by availability of human resources and difficulties associated with detection and with distinguishing them from similar-looking species.

Factors Affecting the Frosted Elfin in the GLA

Frosted elfin populations in the GLA are associated with blue lupine and often co-occur with Karner blue butterflies where they are beneficiaries of management and protection for the latter species. This includes the Saratoga County Airport, where lupine habitats are managed in accordance with a biological opinion for Karner blue butterflies.

Environmental Baseline for Persius Duskywing

Status of the Species in the GLA

The one recently confirmed population site identified in 2008 is in the Saratoga Sandplains Karner blue butterfly recovery area in the Town of Wilton, Saratoga County, New York. This 2-acre site was mapped in 1989 and is occupied by Karner blue and frosted elfin. The site has dense lupine and nectar and a heavy cover of sweet fern. An additional 1.3 acres of habitat were restored adjacent to the original site in 2008. This site is within 200 meters of other habitat occupied by Karner blue and frosted elfin.

Surveys for Persius duskywing are constrained by availability of human resources and difficulties associated with detection and with distinguishing them from similar-looking species.

Factors Affecting the Persius Duskywing in the GLA

The one known extant Persius duskywing population in the GLA is associated with blue lupine and it is anticipated that additional populations may co-occur with Karner blue butterflies where they are beneficiaries of management and protection for the latter species.

Effects to Frosted Elfin and Persius Duskywing

The Service anticipates that actions to be implemented under the SHA will have effects on frosted elfin and Persius duskywing parallel to those projected for Karner blue butterflies, as described above. Beneficial effects will be realized via restoration, enhancement, and maintenance of habitat in Albany, Saratoga, Schenectady, and Warren Counties, where frosted elfin and Persius duskywing are associated with wild blue lupine. Habitat management activities (e.g., mowing by landowners under agreements, prescribed burning by TNC or its designated agents) may cause take of some individual frosted elfin and/or Persius duskywing eggs, larvae, pupae, and adults, but the increased distribution of butterfly populations is anticipated to decrease the likelihood that management activities in any one area will impact many individual butterflies. Furthermore, an expanded habitat base and increased populations facilitated by these management activities on lands enrolled under the SHA are fundamental to increasing the overall demographic security of this disturbance-dependent species. Although return of properties to baseline habitat conditions at the termination of cooperative agreements will cause loss of habitat and take of any individual frosted elfin and/or Persius duskywing not translocated, the species will be no worse off than they would have been without the SHA. Temporary benefits will include provision of supplemental habitat for the duration of agreements, increased potential for genetic exchange among otherwise isolated frosted elfin and/or Persius duskywing populations, and opportunities to increase understanding of frosted elfin and/or Persius duskywing reintroduction and dispersal. In a worst-case scenario, the program will have provided interim benefits in the form of habitat augmentation and range expansion during its duration while other efforts by the Service, NYSDEC, TNC, and partners increase permanently protected habitats in the GLA.

Cumulative Effects

The Service anticipates that all existing threats to frosted elfin and Persius duskywing in the GLA are reasonably certain to continue at approximately current levels. Since frosted elfin and Persius duskywing are not listed under the ESA, other federal actions are not subject to section 7 consultation on these species, but these species may reap collateral benefits from consultations on Karner blue butterflies.

Conclusion

After reviewing the current status of the frosted elfin and Persius duskywing, the environmental baseline for the action area, the effects of actions to be implemented under the proposed SHA, and the cumulative effects, it is the Service's conference opinion that actions to be implemented under the SHA are not likely to jeopardize the continued existence of the species. The proposed

action will facilitate restoration, enhancement, and maintenance of suitable habitat for frosted elfin and Persius duskywing in the GLA that would be very unlikely to occur but for the assurances provided by the SHA. The SHA will provide short-term benefits to the species. In the long-term, frosted elfin and Persius duskywing will be no worse off than they would be without the SHA.

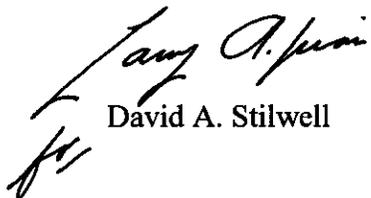
Incidental Take Statement

This incidental take statement does not take effect unless frosted elfin and/or Persius duskywing are listed under the ESA and the conference opinion above, and the following criteria are confirmed as the Service's biological opinion: (1) the potential incidental take is commensurate with the success of TNC in enrolling properties and expanding frosted elfin onto those lands; (2) the level of take anticipated is not likely to result in jeopardy to frosted elfin and/or Persius duskywing; (3) take of frosted elfin and/or Persius duskywing may be properly estimated in acres of landowner-implemented management activities to maintain habitat occupied by frosted elfin and/or Persius duskywing and acres of occupied habitat returned to baseline conditions; and (4) any additional reasonable and prudent measures necessary and appropriate to minimize take of frosted elfin and/or Persius duskywing be identified.

If frosted elfin and/or Persius duskywing are listed under the ESA and the ESP is amended, then monitoring and reporting requirements should be extended to include frosted elfin. Monitoring of Persius duskywing should be consistent with practicability and sound conservation of the species to avoid excessive destructive sampling; use of frosted elfin and/or Karner blue butterflies as surrogates for Persius duskywing may be appropriate. Conservation measures, specified in the description of the proposed action to minimize take of Karner blue butterflies during landowner-implemented habitat management activities, will provide similar benefits to frosted elfin and Persius duskywing whether or not they are ever listed under the ESA.

REINITIATION NOTICE

This concludes formal consultation/conference on the action. As provided in 50 CFR §402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.


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References

Givnish, T.J., E.S. Menges, and D.F. Schweitzer. 1988. Minimum area requirements for long-term conservation of the Albany Pine Bush and Karner blue butterfly: an assessment. Unpublished report prepared by Malcolm Pirnie, Inc. for the City of Albany; Albany, New York.

Harrison, S., D. Murphy, and P. Ehrlich. 1988. Distribution of the bay checkerspot butterfly, *Euphydryas editha bayensis*: evidence for a metapopulation model. *The American Naturalist* 132: 360-382.

NatureServe. 2009a. Frosted Elfin *in* NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: November 19, 2009).

NatureServe. 2009b. Persius Dusky Wing *in* NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: December 14, 2009).

O'Brien, K. 2008. New York State Department of Environmental Conservation. August 28, 2008, Email with attachment to Cathy Carnes, USFWS, Wisconsin Field Office.

O'Brien, K. 2009a. Email from Kathy O'Brien, New York State Department of Environmental Conservation to Anne Hecht, USFWS, Northeast Region, dated December 18, 2009.

O'Brien, K. 2009b. Email from Kathy O'Brien, New York State Department of Environmental Conservation to Anne Hecht, USFWS, Northeast Region, dated November 30, 2009.

O'Brien, K. 2009c. Email from Kathy O'Brien, New York State Department of Environmental Conservation to Anne Hecht, USFWS, Northeast Region, dated November 20 2009.

Schweitzer, D.F. 1989. Fact sheet for the Karner blue butterfly with special reference to New York. Unpublished report prepared for The Nature Conservancy, Albany, New York.

Shepherd, M.D. 2005. Species Profile: *Erynnis persius persius*. In Shepherd, M.D., D.M. Vaughan, and S.H. Black (Eds). Red List of Pollinator Insects of North America. CD-ROM Version 1 (May 2005). Portland, Oregon: The Xerces Society for Invertebrate Conservation.

U.S. Fish and Wildlife Service. 2003. Final Recovery Plan for the Karner Blue Butterfly (*Lycæides melissa samuelis*). U.S. Fish and Wildlife Service, Fort Snelling, Minnesota. 273 pp.

Williams, E. 2007. Email from Ernest Williams, Hamilton College, Clinton, New York, to Robyn Niver, USFWS, New York Field Office, dated March 5, 2007.

Wisconsin Department of Natural Resources. 2000. Wisconsin statewide Karner blue butterfly habitat conservation plan and environmental impact statement. PUBL-SS-947-00. Wisconsin Department of Natural Resources, Madison.